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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314				
EXAMINER				
GILLESPIE, BENJAMIN				
ART UNIT		PAPER NUMBER		
1796				
NOTIFICATION DATE		DELIVERY MODE		
07/16/2008		ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

10/539,830

Applicant(s)

HEISCHKE ET AL.

Examiner

BENJAMIN J. GILLESPIE

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 May 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-8,11-13 and 17-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-8,11-13 and 17-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/S508)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 5/19/2008 has been entered.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claim 13 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Specifically, claim 13 is drawn to the amounts of

- a. fully esterified alkoxyolated polyol,
- b. partially esterified alkoxyolated polyol,
- c. unesterified alkoxyolated polyol,
- d. unreacted (meth)acrylic acid,
- e. esterification catalyst, and
- f. polymerization inhibitor,

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3. However the claimed ranges, specifically the weight ratio ranges for components (a), (b), and (c) do not correspond to the disclosed amounts provided in applicants' specification on page 18, lines 20-25. For example, applicants' specification states the fluid medium has a maximum of 50 wt% of (b) and (c), however the ranges of claim 13 allow a weight ratio of (a):[(b)+(c)] that is 20:50. Assuming that (d), (e), and (f) are present in their minimum amounts, the fluid medium would contain about 70% weight percent of components (b)+(c):

$$[50/(20+50)]*100 = 71.4\%.$$

4. This amount of (b) and (c) is clearly out of the range disclosed on page 18 of applicants' specification, and therefore it is not clear that applicants' had possession of the claimed invention at the time of filing.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claim 13 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 13 states a fluid medium containing amounts of fully (a) esterified alkoxyated polyol, (b) partially esterified alkoxyated polyol, and (c) unesterified alkoxyated polyol that total to 100%, however (a), (b), and (c) are listed in weight ratios, and not weight percentages and therefore it is not clear how the "100%" pertains to the weight ratios.

Furthermore, the fluid medium also contains (d) unreacted (meth)acrylic acid, (e) esterification catalyst, and (f) polymerization inhibitor, which are all present in various weight percentages, however no relative basis have been given for these percentages, i.e. relative to components (a) + (b) + (c) or the total fluid medium, i.e. (a) + (b) + (c) + (d) + (e) + (f); clarification is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1, 3-8, and 11-12, 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lokai et al ('983) in view of Neuhaus et al ('604). Lokai et al teach a radiation-curable urethane (meth)acrylate and a method for its production comprising the reaction product of (A) hydroxyl-functional polyester acrylates with (B) diisocyanate (Abstract).
7. Component (A) is produced in a multi-step process, starting with a) the reaction of an alkoxyolated polyol consisting of trimethylolpropane, trimethylolethane, or pentaerythritol with (meth) acrylic acid in the presence of catalyst, polymerization inhibitor, and solvent that forms an azeotrope with water, wherein the alkoxyolated polyol has a range of ethoxylation between 1 and 30 and is present relative to the (meth)acrylic acid in a molar range of 1:1.1 (Col 2 lines 17-18, 61-62, 66-67, col 3 lines 9-12, col 4 lines 6-17, 50, and col 5 lines 18-20). The esterification reaction may not go to completion, and regarding the claimed removal of water, it should be noted that esterification reactions inherently possess the step of water removal in order to for the reaction to progress. (Col 5 lines 26-29).
8. The product of step a) is then neutralized and has the solvent and excess acrylic acid removed by distillation (Col 5 lines 30-31, and 45-46). The purified reaction product is then b) reacted with bisphenol A diglycidyl ether, butanediol diglycidyl ether or pentaerythritol triglycidyl ether in the presence of appropriate catalysts with resulting OH and acid numbers

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between 40 and 150 mg KOH/g and less than 10 mg KOH/g respectively (Col 6 lines 1-2, 23-25, 34-35, 38-39, 49-50 and col 11 lines 41-43). The reaction product from step b) is then reacted with polyisocyanate in the presence of a catalyst and then combined with a viscosity modifying reactive diluent, wherein the polyisocyanate consists of hexamethylene diisocyanate and/or isophorone diisocyanate (Col 6 lines 61-63, col 7 lines 23-24, 31-33, col 8 lines 22-24). The urethane acrylate is useful in wood coatings, and regarding the claimed compound (K), although patentees teach reactive diluent, there is no teaching to react the urethane acrylate with hydroxylalkyl (meth)acrylate compound (Col 7 lines 64-65).

9. Neuhaus et al teach a radiation-curable urethane acrylate coating, which is the reaction product of (A) hydroxyl-functional polyester acrylates, (B) polyisocyanate, and (C) additional hydroxyl alkyl (meth)acrylate, wherein the resulting composition is useful in coating wood substrates (Abstract; col 7 lines 29-30). In particular, the resulting urethane acrylates inherently exhibit a low viscosity, thereby eliminating the need for reactive diluents which degrade the final coating and cause un-wanted odor (Col 1 lines 20-33).

10. With this understanding the examiner would like reevaluate what is disclosed by Lokai et al and Neuhaus et al:

- a. Lokai et al teach a urethane acrylate that is the reaction product of (A) hydroxyl-functional polyester acrylate, and (B) polyisocyanate, wherein the resulting urethane acrylate is preferably in the presence of reactive diluents.
- b. Neuhaus et al teach a urethane acrylate that is the reaction product of (A) hydroxyl-functional polyester acrylate, and (B) polyisocyanate, AND (C)

hydroxylalkyl (meth)acrylate, wherein the resulting urethane acrylate does not require reactive diluent.

11. It should be noted that while component (A) is not identical in each reference, both are based on alkoxyated polyol and methacrylic acid. With that said, the examiner would like to point out the relationship between Lokai et al and Neuhaus et al, specifically their reactants and resulting properties. Whether the polyurethane acrylate requires a reactive diluent appears to be dependant on the presence of reactant (C); by incorporating the hydroxylalkyl (meth)acrylate, the resulting polyurethane will exhibit a reduction in viscosity, and therefore eliminate the need for reactive diluent.

12. Therefore, it is the examiner's position that it would have been obvious to include hydroxylalkyl (meth)acrylate in Lokai et al since it aids in producing urethane acrylates that do not require reactive diluents. Furthermore, Neuhaus et al explain said (C) hydroxylalkyl (meth)acrylate is incorporated by reacting (A), (B), (C) simultaneously, and therefore it would have been obvious to arrive at applicants' step "I)" since Neuhaus et al teach the polyisocyanate and hydroxylalkyl (meth)acrylate are reacted only after (A) has been synthesized. Finally, although Lokai et al teach that the NCO:OH ratio between (A) and (B) is 1:1, it would have been obvious to modify this ratio in order to incorporate component (C) into the final polyurethane.

13. Claims 1, 3-8, and 11-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lokai et al ('983) in view of Neuhaus et al ('604) and in further view of Paulus et al ('991). Aforementioned, Lokai et al in view of Neuhaus et al render obvious a urethane acrylate comprising the reaction product of (A) hydroxyl-functional polyester acrylate, and (B) polyisocyanate, AND (C) hydroxylalkyl (meth)acrylate. In particular, (A) is produced by first

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reacting alkoxyolated polyol with (meth)acrylic acid, wherein said reaction may not go to completion. However, the prior art fail to specify amounts of fully, partially esterified alkoxyolated polyol, or completely unreacted (meth)acrylic acid corresponding to the ranges of claim 13.

14. Paulus et al teach compositions comprising light esters of acrylic acid and/or meth-acrylic acid, which when used in urethanes, are useful in wood coatings (Abstract; col 2 line 38; col 4 lines 52-58). In particular, patentees explain that these esters are generally prepared by reacting acrylic acid with hydroxyl containing compound, and depending on whether free OH or additional acrylate compounds are desired, one of ordinary skill would modify the ratio OH groups relative to the acrylic acid (Col 2 lines 42-48).

15. Therefore, it would have been obvious to have an excess of hydroxyl containing material relative to the acrylic acid in step one of Lokai et al in view of Neuhaus et al since it would preserves free OH groups, necessary to react with the epoxy compounds of step two. What's more, based on this logic and the fact that Lokai et al specifically teach the esterification reaction does not have to go to completion, it would have been obvious to arrive at the ranges of claim 13 because it has been held that where the general conditions of a claim are disclosed in the prior art, discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesh*, 617 F. 2d 272, 205 USPQ 215 (CCPA 1980).

Response to Amendment

16. Applicants' amendment filed 5/19/2008 with respect to the rejection of claim 13 under 35 U.S.C. 112 2nd paragraph has been considered and resolves the original issue, however as previously discussed in paragraphs 2-4, new concerns have been raised.

Response to Arguments

17. Applicant's arguments filed 5/19/2008 have been fully considered but they are not persuasive. Applicants assert the claimed invention is patentable over the prior art because of ordinary skill would not have been motivated to combine the teachings of:

- a. Lokai et al ('983) and Neuhaus et al, or
- b. Lokai et al ('983), Neuhaus et al ('604), and Paulus et al ('991)

18. Since there are only two different approaches one could use to incorporate the hydroxylalkyl(meth)acrylate in the polyurethane of Lokai et al, and both adversely affect the resulting polyurethane.

19. The first consists of combining the hydroxylalkyl (meth)acrylate with unreacted epoxide compounds, however one would not be motivated to utilize this approach since Neuhaus et al clearly teach that the hydroxylalkyl(meth)acrylate is only included after the hydroxyl-functional polyester acrylate is synthesized.

20. Applicants' go on to argue that the second approach, which consists of reacting hydroxylalkyl(meth)acrylate with the polyisocyanate and polyester acrylate, would produce polyurethane that "one of skill in the art would not expect to be that of Lokai et al." However, the examiner would like to point out that applicants' have not provided any factual data supporting this position, and instead appear to be relying on an unsubstantiated opinion which is not persuasive. Hence, the examiner maintains the rejection of claims 1, 3-8, 11-13, and 17-21.

Conclusion

21. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Benjamin J. Gillespie whose telephone number is 571-272-2472.

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The examiner can normally be reached on 8am-5:30pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 571-272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

22. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Rabon Sergeant/
Primary Examiner, Art Unit 1796

B. Gillespie